

Installation Instructions & Operation Manual

Photovoltaic Modules

CSSS-100 Series

CHI MEI GROUP

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This manual is current as of September, 2008. Chi Mei Energy, Corp., reserves the right to update or modify the information therein at any time without prior notice.

1. General

This manual includes information for both installation and operation of the thin film solar cells modules. Please read this manual carefully before installing the system and carry out the installation procedures correctly. Improper operation or fail to follow this manual may result in serious injuries of human beings or damage to properties. Obey the local government installation, inspection and safety requirements before installation. If they are not otherwise specified, it is recommended to follow the requirements of corresponding European Code.

2. Product Specifications

- Dimensions: $1,414 \pm 3 \text{ mm} \times 1,114 \text{ mm} \pm 3 \times 35 \pm 1 \text{ mm}$
- Weight: $20 \pm 1 \text{ Kg}$
- External Dimensions showed in Figure1.

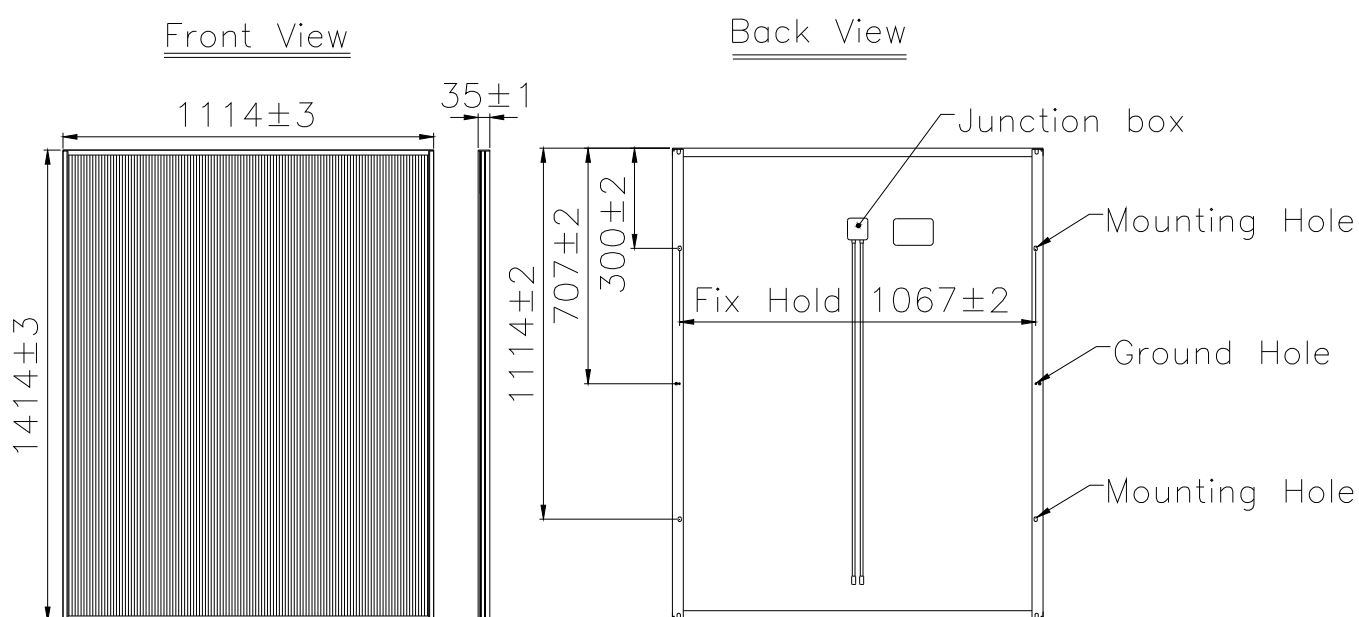


Figure1: External dimensions of CSSS-100 series PV module.

- Electrical Rated Data of CSSS-100 series

Model Electrical Data	CSSS-100	CSSS-090	CSSS-080
Rated Power (Pmax)	100W	90W	80W
Open Circuit Voltage (Voc)	100VDC	99VDC	98VDC
Short Circuit Current (Isc)	1.65A	1.60A	1.54A
Max. Power Voltage (Vmp)	76.0VDC	71.4VDC	67.0VDC
Max. Power Current (Imp)	1.32A	1.26A	1.20A
Max. Series Fuse Rating	3A	3A	3A
Max. System Voltage	600VDC	600VDC	600VDC

- The rated electrical characteristics are within $\pm 10\%$ of the indicated values of I_{sc} , V_{oc} , I_{mp} , V_{mp} and P_{max} under Standard Test Conditions (STC) : Irradiance of 1000 W/m^2 with AM 1.5 light spectrum at a cell temperature of 25°C .
- CSSS-100 series are classified to Safety Class II according to IEC 61730-1 and IEC 61730-2.

3. Safety Precautions



WARNING: Electric Shock Hazard!

The solar modules generate electricity whenever it is exposed to sunlight or other similar light sources. Take care not to short circuit the output cables. The cables may become overheated.

- The system should be installed only by certified PV installers.
- When connecting a lightening protection system to the solar power modules, observe and adhere to the national regulations.
- Incorrect installation may cause damages of equipment and place people at risk.
- Cover the front face of the PV modules with opaque materials prior to connect or disconnect any electrical connections.
- Before working on PV modules, make sure to disconnect them from other sources of electricity.
- CME CSSS-100 Series PV modules are NOT designed to expose to concentrated light sources, which will result in excess electrical current and a high risk of damage.
- The maximum permissible system voltage for the solar power modules must not exceed 600V (refer to Electrical Rated Data).
- The solar power modules like glass products. Do not drop anything on the solar power modules.
- Do not step on PV modules or subject them to external load or impact.
- Avoid unnecessary bending moment or twisting forces to PV modules.
- Protect the solar power modules against damages. Do not install damaged solar modules.
- Do not install PV modules near naked flames or flammable materials.
- Make sure adequate protective tools are used. Remove any metallic jewelry or ring, which may cause electrical shock, before installation.

4. Handling & Installation

- The solar power modules should be installed to prevent shadowing effects.
- Ensure that the back of the module is well vented.
- Make sure all electrical parts are dry and clean before installation.
- In order to prevent dirt accumulation on the glass or inside of frames which could cause deterioration of reliability, installation with angle less than 5° is prohibited. Installation with angle larger than 15° is recommended.
- To protect against sharp objects and burns, always wear protective gloves when handling PV modules.
- Avoid installing PV modules in high corrosion environment.
- Use a listed fuse or circuit breaker rated for the maximum series fuse rating of the module and the system voltage.
- Under normal conditions, a photovoltaic module may experience conditions that produce more current and/or voltage than reported at Standard Test Conditions. Accordingly, the values of Isc and Voc marked on electrical rated listed modules should be multiplied by a factor of 1.25 when determining component voltage ratings, conductor capacities, fuse sizes and size of controls connected to the module output. An additional multiplying factor of 125% (80% derating) may be applicable as a safety factor.

5. Mounting Method

- PV modules need to be securely fixed at least at the existing 4 holes on the long frames as illustrated in Figure2.
- The PV modules only can be installed vertically.
- Do not mount on short frames or on other unauthorized drilled holes. Doing this will result in a high risk of module failure and invalid the warranty. (Figure3)
- Do not step on PV modules or subject them to external load or impact.
- There are two common fixing practices. Case I (Figure4) uses M6 stainless steel bolts, washers, lock washers and nuts. Case II (Figure5) uses clamp jigs offered by system installers, materials of clamp jigs are suggested to use aluminum alloys. In case clamp jigs are composed of other type metal materials, insulating material between frames and clamp jigs is required to prevent contact corrosion.
- The clamp jigs which are used must not cover or contact with the front glass and must not deform the module frame.
- Note all mounting materials should be antirust, it is necessary to avoidance of contact corrosion between different materials). Mount on at least the 4 mounting holes of the long frames.
- Due to the thermal expansion of the module frames made of aluminum, the recommended distance between two PV modules is 5 mm.
- If PV modules are installed on roofs or windows on the building, the mounting method should also obey the local building regulations.
- Clearance between the module and supporting rack is required to allow air circulating behind the module.
- The support rack should be installed avoiding interference with junction box. The gap between support rack and junction box should be larger than 50mm.

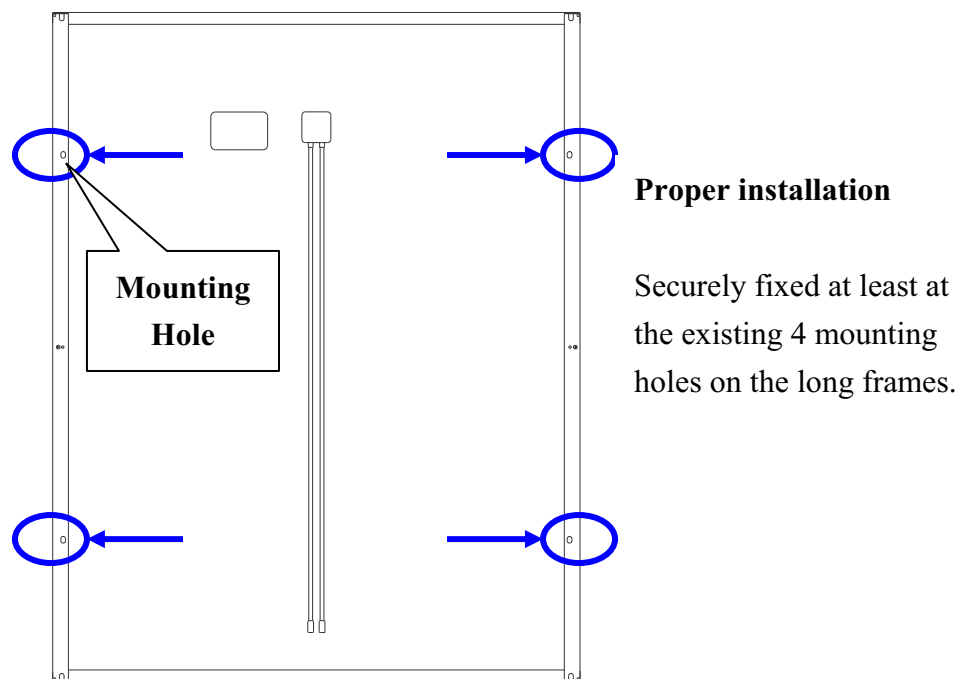


Figure2 : Valid mounting points of the PV module on the long frames.

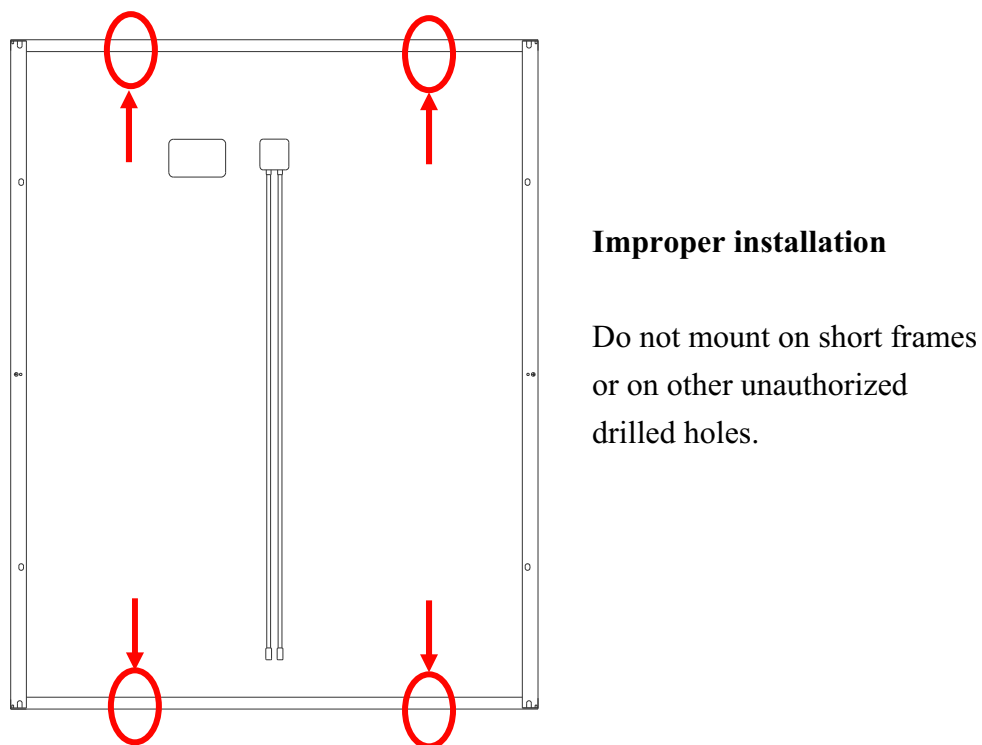


Figure3 : Invalid mounting points of the PV module on the short frames.

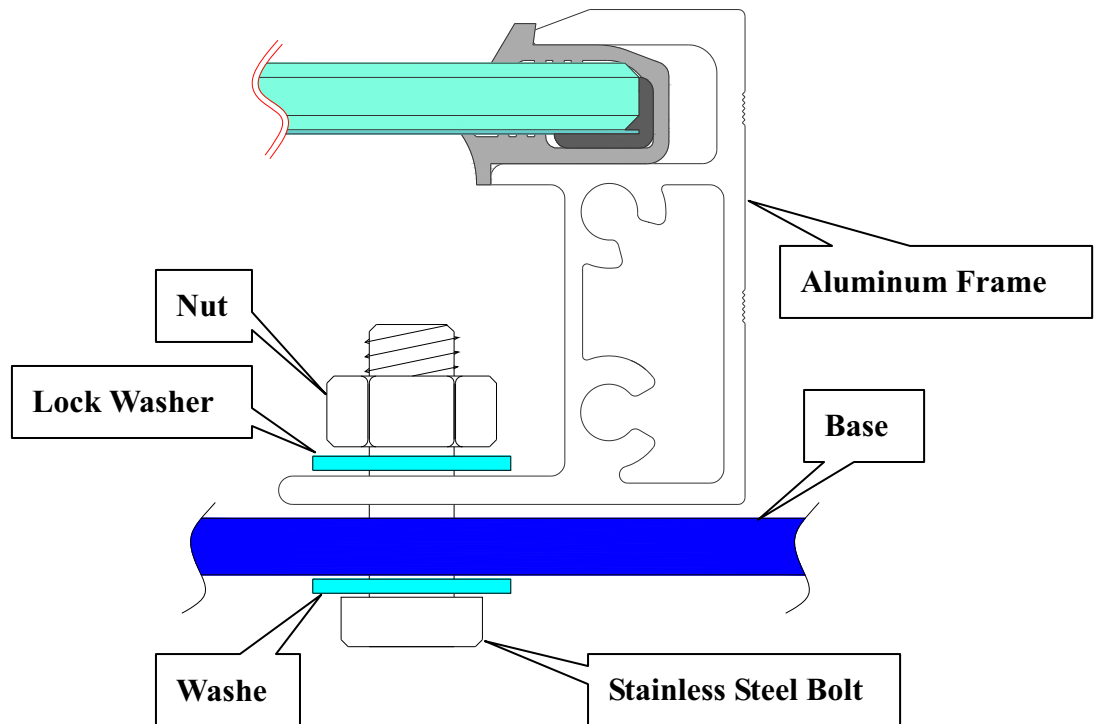


Figure4 : Fixing practice of “Case I”.

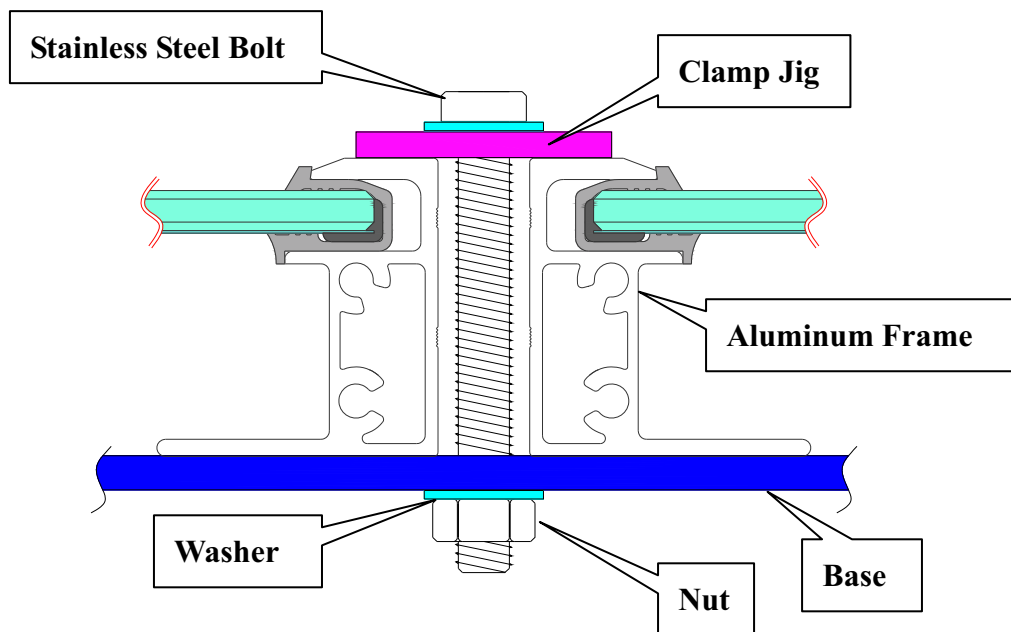
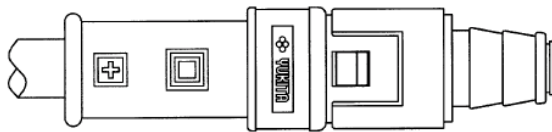


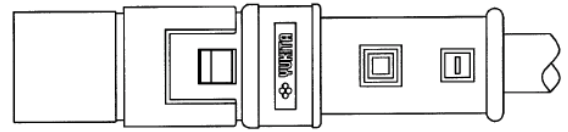
Figure5 : Fixing practice of “Case II”.

6. Wiring & Connecting

- There are no user serviceable parts inside the PV module.
- The wiring should consider the maximum system voltage by 600V direct current voltage.
- Do not try to connect/disconnect the PV modules when current is flowing.
- If additional cables are needed, only use photovoltaic wires, which can be rated sunlight resistant, and all wiring exposed to the weather.
- Photovoltaic wires have a mark showing “2Pfg1169 Cable for Photovoltaic System approved by TUV”.
- The connectors are marked with respective polarity. The plus pole shows a plus symbol ‘+’ and minus pole shows a minus symbol ‘-’ on the respective connector. (Figure6)
- The connectors are MC $\phi 3\text{mm}$ plugs-compatible.
- Be absolutely sure the modules’ polarity before wiring.
- Wrong polarity wiring may impair function of Junction box.



Plus, +



Minus, -

Figure6 : The connectors are marked with respective polarity

7. Grounding

- For safety reasons, each PV module should be grounded.
- Use the ground hole on the PV module frame to conduct electricity to the Earth.
- To ensure the conductance of the anodized aluminum frame, a star washer is used on purpose to destroy the insulation layer on the frame.
- It is recommended to use a M4 stainless bolt with other necessary parts as showed in Figure7.
- Be careful about your inverter selection and grounding. Voltage of the PV module that has more negative potential than the ground /earth potential should not occur. Please use an inverter that meets this requirement. (Please contact the manufacture of the inverter for more information.)

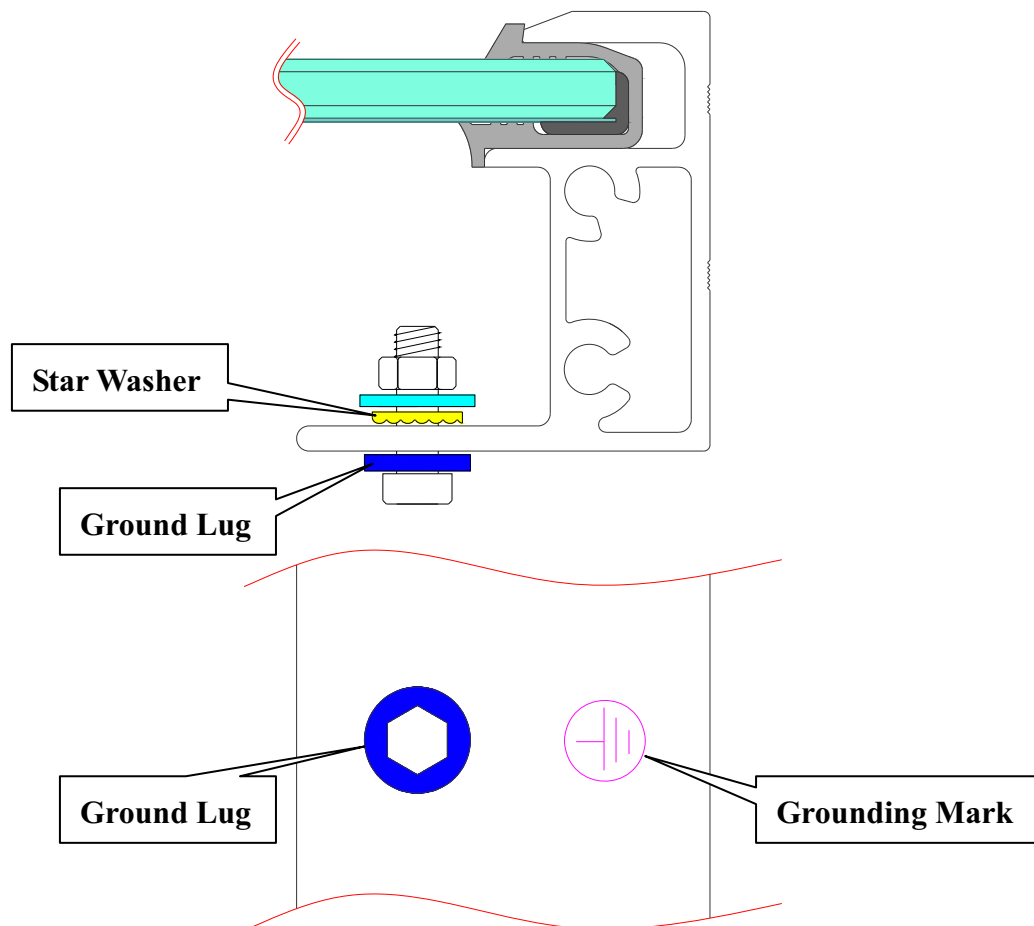


Figure7 : The diagram of grounding structure for PV module.

8. Maintenance

- Although rainfall is usually sufficient to self clean the front cover dusts of PV modules, sometimes moss or the like may appear. We recommend the periodical cleaning by using clean water with soft sponge (or other gentle materials).
- If some detergents are intentionally applied, make sure they are harmfulness to PV modules, especially corrosion may occur on aluminum frames.
- Regular interval inspection may be needed. If the front glass is broken, or the backsheet is torn, replace the PV module immediately and carefully to avoid system efficiency decrease. Do not try to replace any parts inside the modules. It may cause electric shock and invalid the warranty.